7033

C20-EC–106

# 7033

## BOARD DIPLOMA EXAMINATION, (C-20)

## OCTOBER/NOVEMBER—2023

## DECE – FIRST YEAR EXAMINATION

ELEMENTS OF ELECTRICAL ENGINEERING

*Time* : 3 Hours ] [ *Total Marks* : 80

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**PART—A** 3×10=30

**Instructions :** (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

**1.** Define magnetic flux density.

**2.** Define electric flux.

**3.** Classify induced EMF.

**4.** State Ohm's law and write the formula.

**5.** Define admittance.

**6.** Define reactance.

**7.** State the losses in a transformer.

**8.** Define voltage transformation ratio of a transformer.

**9.** State the need of starter for DC motor.

**10.** List any three specifications of DC motors.

## PART—B

8×5=40

**Instructions :** (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

**11.** *(a)* State and Explain Faraday's laws of electromagnetic induction.

**(OR)**

*(b)* Find the equivalent capacitance of $1 \times 10^{-6}$ F, $2 \times 10^{-6}$ F and $3 \times 10^{-6}$ F connected in parallel.

**12.** *(a)* Derive the expression for equivalent resistance when three resistors are connected in series.

**(OR)**

*(b)* State Kirchhoff's laws.

**13.** *(a)* Explain the response of a pure inductor when connected across the AC supply.

**(OR)**

*(b)* Explain the AC response of a series RC circuit.

**14.** *(a)* Explain the applications of isolation transformer and current transformer.

**(OR)**

*(b)* Explain the working principle of a transformer.

**15.** *(a)* Explain the working principle of a DC motor with a neat sketch.

**(OR)**

*(b)* Explain the principle of operation of a stepper motor.

## PART—C

10×1=10

**Instructions :** (1) Answer the following question.

(2) The question carries **ten** marks.

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

**16.** A resistance of 25 Ω and a capacitance of 1.5 μF are connected in series across a 220 V, 50 Hz AC supply.

Calculate —

*(a)* Power factor

*(b)* Power dissipated in the circuit

*(c)* Current

*(d)* Impedance

*(e)* Voltage across resistor

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